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ABSTRACT

A study was conducted at the University of Wisconsin (UW)-Eau Claire and UW-Stout in 1992 to assess the computer skills of incoming college freshmen. Information about the students' computer skills was obtained through the use of a questionnaire. The questionnaire was distributed to 92 students at UW-Eau Claire and 86 students at UW-Stout. Information was gathered about the amount and type of students' previous computer experience, the source of the experience, and their attitudes toward using computers. Demographic information, such as age, sex, and major, was also collected. The study found that approximately 90% of the students surveyed possess some computer experience, with over 80% of the respondents reporting more than a year of computer experience. Over 90% of those who had used computers had used word processing software and over 90% of the students reported gaining their computer experience in high school. Overall, students reported positive attitudes toward computers, and students with greater amounts of computer experience typically reported more confidence in their computing abilities. (Contains 20 references.) (Author)

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TITLE: An Assessment of the Computer Skills of Incoming Freshmen at Two University of Wisconsin Campuses

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ABSTRACT:

A study was conducted at the University of Wisconsin-Eau Claire and the University of Wisconsin-Stout in 1992 to assess the computer skills of incoming college freshmen. Information about the students' computer skills was obtained through the use of a questionnaire. The questionnaire was distributed to 92 students at UW-Eau Claire and 86 students at UW-Stout. Information was gathered about the amount and type of students' previous computer experience, the source of the experience and their attitudes toward using computers. Demographic information, such as age, sex and major, was also collected. The study found that approximately 90 percent of the students surveyed possess some computer experience, with over 80 percent of the respondents reporting more than a year of computer experience. Over 90 percent of those who had used computers had used word processing software and over 90 percent of the students reported gaining their computer experience in high school. Overall, students reported positive attitudes toward computers, and students with greater amounts of computer experience typically reported more confidence in their computing abilities.

KEY WORDS: computer, computer experience, computer skills, computer attitudes, college students

Introduction

The role of computers in society has increased in importance in recent years, and it has become evident that experience in computer use will be a critical factor in achieving success in many fields. For many students graduating from post-secondary institutions, it is essential to have skills in microcomputer applications in their chosen career field.

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Much has been written about the use of computers as teaching tools in higher education. Many educators have embraced computer technology as an effective teaching tool and have integrated it into their classrooms. The effectiveness of computers as instructional tools has been documented in a variety of disciplines [2, 4, 15, 19, 20].

Curriculum designers seem to have abandoned the debate over whether computers should be introduced into the classroom and have turned their focus on the questions of when and how computers can be used effectively in education [12]. But before computers can become an integrated part of the educational environment, educators need to know what computer experience students bring with them to the classroom.

Limited research has been done to identify students' skill levels in computer use as they enter post-secondary educational institutions. Many factors could produce wide variations of skill levels in students entering colleges, universities or technical colleges. The computer skills of students entering higher education may vary depending on where and when they attended high school, the work experience they have had, and their personal interest in computers. An assessment of students' computer literacy could help educators in curriculum planning and in developing strategies to incorporate computer use into various instructional settings. Such a skill assessment could be particularly useful for educators who teach classes that use computers as part of their instructional methodologies. Identifying the existing computer skills of incoming freshmen could help teachers effectively plan curricula that would strike a balance between computer training and content instruction.

The status of students' computer skills is of interest to instructors who teach introductory computer literacy courses and to instructors who teach other subjects, such as writing or mathematics, in a computer lab. Due to the varying levels of computing ability among college freshmen, instructors who teach computer literacy courses are often faced with the difficult task of teaching courses to students with an increasingly wide variety of experiences [3]. Although the computer software used by students in many college courses is fairly simple and easy to use, the students still can spend a significant portion of their class time mastering the software. The computer technology sometimes interferes with or detracts from students' ability to focus on the content being taught.

In an effort to learn more about students' previous computer experience, a study was performed during the summer and fall semesters in 1992 to evaluate the computer skills of freshmen entering two campuses in the University of Wisconsin System. It is hoped that this study can be used by educators in a wide variety of subject areas in planning classes as part of their curricula.

Research Questions

The following research questions guided the study:

1. How long have students been using computers as they enter the university as freshmen?
2. What kind of computer experience, if any, do incoming freshmen have? (e.g. word processing, desktop publishing, programming, spread sheets, data bases, graphics packages, computer games)

3. Where did students obtain their computer experience? (e.g. school, work, home)
4. Is there a relationship between the size of high school attended and the level of computer skills?
5. Is there a relationship between student gender and the level of computer skills?
6. What are students' attitudes toward computer use?

The answers to these research questions will be used to identify the existing computer skill levels of new freshmen in order to develop curricula that is relevant to the students' needs.

Review of the Literature

A number of studies have been done in education settings to measure students' computer literacy, which refers to students' knowledge about computers and computer operations [14], and to identify how computer literacy affects students' ability to use computers in the classroom [17]. In a study at the University of Virginia, Loyd and Gressard [12] found that levels of computer experience varied greatly in the students they studied. Their study indicated that students with more computer experience were significantly more confident in their use of computers than were students with little computer experience. Increased confidence was viewed as a positive factor by the researchers, and it was found to influence students' general attitudes toward computer use.

A study conducted at Purdue University [18] also tried to measure students' knowledge of and previous experience with computers. Sullivan's study attempted to gain

a systematic knowledge of students' computer backgrounds. She found that although about half the students surveyed had some previous experience with computers, many of those students did not use computers regularly and had no motivation for using computers in their classes. Sullivan suggested that more complete knowledge about students' computer literacy could help educators eliminate misconceptions about students' abilities and develop curricula that more closely meets the needs of the students.

Since 1985, students in freshmen computer literacy courses at Bentley College have been completing a questionnaire regarding their precollege computing experience [3]. The major trend indicated by these annual surveys is that the number of students with a background in programming is decreasing; however, the number of students with some background in productivity software is increasing. The results of this study have been used to tailor the school's computer literacy course to students' backgrounds.

In addition to examining how students' computer experience affects current learning, several studies have been done to measure how past computer experience and anxiety about computer use may be linked. Howard, Murphy and Thomas [6] found that increased computer experience reduced students' computer anxiety. Their study found that students' levels of anxiety about using computers could be reduced by providing the students with more computer knowledge and computer experience; more hours of computer experience at the college level seemed to promote higher levels of confidence among students. The researchers suggested that students who enter introductory courses with minimal experience and little knowledge about computers are more likely to suffer from high computer anxiety; therefore, classes that include computer training should be

designed with the needs of these potential students in mind [6].

Lee [10] also studied the effects of computer experience on computer anxiety. In a study at the University of North Carolina at Charlotte, Lee found that past computer experience significantly affected performance in classroom activities in which students used computers. Lee suggested that minimal experience with computers may be sufficient to reduce anxiety, since there was not a significant difference between the performance of students whose computer skills were classified as "low experience" or "high experience." Other researchers have also hypothesized that inexperience and unfamiliarity with computers can cause high levels of anxiety and that such anxiety can interfere with students' academic performance [5, 7, 8].

Gender also has been studied as a factor related to students' computer literacy and computer anxiety. In a study at a private, liberal arts college, Arch and Cummins [1] found that males tended to use and like computers more than females did. The researchers found that females tended to approach computers in a lab less frequently than males did, and females had a more negative attitude about computers and their ability to use them. However, structured instruction in the use of computers helped both males and females achieve a more positive attitude toward computer use and more confidence about their computer skills [1].

Another study [13], which was conducted in 1989 and 1990 at Byrant College, provided evidence that gender differences are present in the computer experience, skills and attitudes of incoming college freshman. Although there were no differences in the amount of computer experience, males had more experience and skills than females in

specific types of computer usage, particularly programming.

Additional studies have also found that factors such as sex, age, experience and interest in computers can affect students' attitudes toward and use of computers [11, 16]. The findings of these and other studies suggest that additional research needs to be done to identify factors that could influence students' ability to use computers in an educational setting. A 1982 literature review by Lawton and Gershner [9] found few empirical studies about issues related to computer literacy, which further suggests that there is a need for additional research in this area.

Methodology

This study to measure students' computer literacy was done in June and July 1992 at the University of Wisconsin-Eau Claire and in September at the University of Wisconsin-Stout. The University of Wisconsin-Eau Claire is a liberal arts college with an enrollment of approximately 10,000 students, and the University of Wisconsin-Stout, which has an enrollment of approximately 7,500 students, is a special mission university which offers a number of technically-oriented undergraduate and graduate programs.

As part of the study, a survey questionnaire was developed and distributed to 92 individuals who were participating in the summer freshmen orientation program at UW-Eau Claire. A written questionnaire was chosen as an appropriate data collection instrument because it allowed many people to be surveyed in a short period of time.

A faculty adviser who led the orientation sessions distributed the questionnaire to the students being surveyed and explained its purpose. The students were assigned to

their orientation sessions by the admissions office, rather than by any random selection method. This intact group consisted of 92 students (23 men and 69 women).

An identical questionnaire was given to freshmen enrolled in three sections of a communication and information technology course at UW-Stout in September 1992. The instructors of the course distributed the survey and explained its purpose. This group consisted of 86 students (50 men and 36 women). Although 75 percent of these students had declared majors in business administration, the group also included students with majors in building construction, industrial technology and technology education. The number of respondents in the study will limit the generalizability of the results of this study to the larger population of incoming freshmen in all majors.

The questionnaire used for data collection was designed to obtain information about students' computer skills as they entered the university. (Appendix A contains a copy of the questionnaire.) The survey instrument included questions about the amount of computer experience students had received and the types of computer use with which they were familiar. The questionnaire also collected demographic data about the students, including their age, sex, size of their high school, location of their high school and the source of any previous computer experience. The questionnaire also contained a short section that was designed to measure students' attitudes toward computer use.

The questionnaire responses were tabulated with the help of UW-Eau Claire's Computing/Networking Services and UW-Stout's Computer User Support Services. The SPSS computer program was used to perform the analysis, and frequencies were calculated for each question. Cross tabulations between answers were done with the help

of Computer/Networking Services to attempt to identify relationships between the level of computer skills the students had when they entered the universities and other factors, such as sex and high school size.

Results

The results of this research study show that many of the students surveyed had some computer experience when they entered the university, and many of them had knowledge of word processing. At UW-Eau Claire, nearly 72 percent of the respondents reported having used computers for more than a year, with 9.9 percent having used computers for three to 12 months. Although 11 respondents left the question blank, none reported zero computer experience.

Of the respondents who had used computers, 91.3 percent had used word processing, 15.2 percent had done computer programming, 32.6 percent had used spread sheets, 30.4 percent had used data bases, 28 percent had used graphics packages, and 26.1 percent reported using desktop publishing, while 48.9 percent had used computer games. Most of the students who had computer experience (94 percent) identified high school as the source of that experience. More than 40 percent (42.4) reported using computers at home, and 14.1 percent said they used computers at work.

The results of the questionnaire distributed at UW-Stout were similar, with 93.7 percent of the students reporting some computing experience, and 84.3 percent of the students reporting a minimum of one year of computer experience. Ninety-four percent of the students with computer experience had used word processing software, 35.4

percent had done computer programming, 50.6 percent had used spread sheets, 44.3 percent had used data base programs, 17.7 had used graphics packages, 22.8 had used desktop publishing software, and 62 percent had used computer games.

Most of the students who had computer experience (94.9 percent) identified high school as the source of their experience. However, 45.6 percent of the students reported they had gained computer experience at home, and 17.7 percent indicated they had obtained computer experience through their jobs.

Computer Experience and High School Size

A comparison between the size of respondents' graduating classes and the amount of computer experience they reported at UW-Eau Claire showed that almost half (47) of the 78 students who had more than a year of computer experience had attended high schools with fewer than 200 in the graduating class. Less than one fourth of the students with more than a year of computer experience (20) had attended schools with 200 to 399 students in the graduating class, and another two respondents with less than a year of computer experience had graduated from schools with 400 to 700 in the graduating class. These numbers do not seem to indicate that larger schools necessarily offered more opportunities for students to gain computer experience.

Data from UW-Stout also indicated that there appeared to be no correlation between the size of the high school students had attended and the amount of computer experience they reported, nor was high school size related to the types of computer experience the students reported. From the data received, it was difficult to differentiate

between students who attended urban or rural high schools.

Computer Experience and Gender

Of the 81 respondents at UW-Eau Claire who reported having any computer experience, females represented 75 percent and males represented 25 percent. Of the students reporting more than a year of computer experience, similar proportions were found: 77 percent were female and 22 percent were male. These totals parallel the proportion of males and females who completed the questionnaire.

At UW-Stout, of the seven respondents who reported having no computer experience, six were male and one was female. Although men and women had approximately equal experience with word processing, spread sheets and data bases, men were more likely to have had more experience in programming and in using graphics and desktop publishing packages than were women.

Attitudes Toward Computers and Computing

Comparisons between the amount of computer experience reported and the responses to the attitude questions also provided data about the respondents. At UW-Eau Claire, of the 81 students who reported they had used computers, 38 said they avoided using computers. No great difference existed between the responses of students with experience and students without computer experience. Three respondents with more than a year of computer experience said they did not avoid using computers. Sixteen students chose the neutral response. More than two-thirds of all the respondents

(66) said they did avoid using computers.

Two respondents (2.2 percent) said they enjoy using computers, while 63 respondents said they did not enjoy using computers. Of respondents with less than a year of computer experience, none said they look forward to using computers, and 11 said they did not enjoy using computers.

Similar numbers were found in responses to a statement about students' confidence in their computer abilities. Over half the students with more than a year of experience (16) said they had confidence in their abilities. Of the students with less than a year's experience, seven reported being confident about their computer abilities, and one reported that a lack of confidence about his/her abilities. Five students gave a neutral response.

Despite their reported experience, 13 students with more than a year of computer experience said they do not use computers as well as other people. Of students with less than a year of experience, none reported that they do not use computers as well as others. Of all the respondents, 16.4 percent reported a lack of confidence in their computer abilities.

Overall, the students surveyed at UW-Stout reported more positive attitudes toward computers and computing. Seventy-three percent of the students agreed or strongly agreed to the statement "I enjoy using a computer." Less than five percent of the students agreed or strongly agreed to the statement "I avoid using computers."

However, students were divided when rating their confidence in using computers. Twenty-six percent of the students said they were not confident about their computing

abilities, 33 percent of the students were neutral regarding their computing abilities, and 27 percent of the students said they were confident about their computing abilities. In general, students with more computer experience were more likely to be confident about their computing abilities.

Although 95 percent of the students said they enjoyed using computers, 48 percent of the students reported that they did not use students as well as others. Twenty-six percent of the students were neutral when comparing their computer abilities to the abilities of other students, and 12 percent said they used computers as well as others. Again, students with more computer experience were more likely to believe they used computers as well as other students.

Conclusions

This study provided some interesting information about the computer skills of students entering the two universities. Approximately 90 percent of the respondents reported having some computer experience, and over 90 percent of them said they had used word processing. This information should be encouraging for instructors who plan to use computers as part of their instructional methodology. It appears that most incoming students could be expected to have some knowledge of computer use, particularly word processing.

A much lower number of students reported having experience with desktop publishing and graphics packages. Instructors who plan to incorporate these computer applications into their classrooms might consider spending additional time on computer

training for the students in these areas.

Although over 90 percent of the respondents reported gaining computer experience in high school, there did not appear to be any strong relationship between the size of the students' graduating class and the amount of experience they received. Without additional analysis, it would be difficult to determine if there was any relationship between the amount of students' computer experience and the location (rural or urban) of their high schools.

The responses to the attitude questions seem to indicate that many students like to use computers. It also appears that the more computer experience students obtain, the more positive their attitude becomes and the more confident they become about their computing abilities; therefore, familiarity with computers and increased experience may help reduce students' anxiety about computer use. Increasing the amount of class time available for computer practice and experimentation could help lessen students' fears about computer use and could help them build confidence in their abilities.

The information gathered in this study about students' experience with computers could help instructors allot appropriate amounts of time to computer training for their students and to content instruction. For example, the curriculum for a publication production class in which most students were familiar with desktop publishing could be taught differently than a class in which few of the students had used computers. An assessment of students' skills could help educators make sound educational choices about the selection of teaching methods and curricula. It is hoped that the results of this study can be used to assist curriculum planning and to develop courses that take into account

students' interests and skill levels. Additional research is recommended to help identify trends and patterns regarding the computer skills of college students.

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BIOGRAPHICAL SKETCH

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APPENDIX A:

Copy of survey